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DALLAS OFFICE OF FULBRIGHT & JAWORSKI L.L.P.
2200 ROSS AVENUE
SUITE 2800
DALLAS, TX 75201-2784

EXAMINER	
CAI, WAYNE HUU	
ART UNIT	**PAPER NUMBER**
2681	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/635,367	GONG ET AL.	
	Examiner	Art Unit	
	Wayne Cai	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-109* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-109* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 109 recites the limitation "said multiple antenna patterns and signal strength predictions" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-8, 12-14, 32, 75-78, 86-87, and 108 are rejected under 35 U.S.C. 102(e) as being anticipated by Benes et al (hereinafter Benes) (US 2004/0203539 A1).

Regarding claims 1, 75, 76, Benes discloses a system, a method comprising:

a database (i.e., a data storage, paragraph 0028) containing antenna gain differences between multiple antenna patterns of a wireless network access node (paragraphs 0021-0023);

calculation logic for determining receive signal strength differences of a signal received using said multiple antenna patterns, said signal being transmitted by a device disposed within one or more of said multiple antenna patterns (paragraph 0026);

comparison logic for comparing said receive signal strength differences to said antenna gain differences and identifying a closest match (paragraph 0027).

Regarding claims 2, and 86, Benes discloses the system, and method of claims 1, and 75 as described above. Benes also discloses wherein said database contains antenna gain differences between multiple narrow antenna patterns and a wide antenna pattern (paragraphs 0021, and 0026).

Regarding claims 3, and 87, Benes discloses the system, and method of claims 1, and 75 as described above. Benes also discloses wherein said database contains antenna gain differences associated with each antenna pattern of said wireless network access node (paragraph 0026).

Regarding claim 4, Benes discloses the system of claim 1 as described above. Benes also discloses wherein said database associates ones of said antenna gain differences in antenna gain difference sets (paragraph 0021).

Regarding claim 5, Benes discloses the system of claim 4 as described above. Benes also discloses wherein each antenna gain difference set includes angle information (paragraph 0022).

Regarding claim 6, Benes discloses the system of claim 5 as described above. Benes further discloses wherein said angle information comprises an azimuthal angle of

a vector pointing from said wireless network access node to said device (paragraph 0023).

Regarding claim 7, Benes discloses the system of claim 4 as described above. Benes also discloses wherein antenna gain difference sets include antenna gain differences of a plurality of wireless network access nodes (paragraph 0018).

Regarding claim 8, Benes discloses the system of claim 7 as described above. Benes further discloses wherein said antenna gain difference sets including antenna gain differences of a plurality of wireless network access nodes include position information (paragraph 0020).

Regarding claim 12, Benes discloses the system of claim 1 as described above. Benes also discloses wherein said calculation logic and said comparison logic are disposed at a centralized system in communication with a plurality of wireless network access nodes (paragraph 0028; fig. 1, and its descriptions).

Regarding claim 13, Benes discloses the system of claim 1 as described above. Benes also discloses wherein said calculation logic and said comparison logic are disposed in a distributed configuration (paragraphs 0027-0028).

Regarding claim 14, Benes discloses the system of claim 13 as described above. Benes also discloses wherein said calculation logic is disposed within said wireless network access node (paragraph 0028).

Regarding claim 32, Benes discloses the system of claim 1 as described above. Benes also discloses wherein said closest match is utilized in identifying location of said device in a service area of a wireless network (paragraphs 0027-0028).

Regarding claim 77, Benes discloses the method of claim 76 as described above. Benes further discloses estimating a position of said device as a function of said direction (paragraph 0018).

Regarding claim 78, Benes discloses the method of claim 75 as described above. Benes also discloses identifying a position stored in association with said closest match (paragraph 0028).

Regarding claim 108, Benes discloses a system for providing location positioning of a device in a wireless network, said system comprising: a channel model independent determination algorithm utilizing receive signal strength differences between multiple antenna patterns of a wireless network node (paragraphs 0026-0027), and antenna gain differences between said multiple antenna patterns to determine information with respect to a position of said device (box 1020 and its descriptions).

5. Claims 38-49, 62-63, 68-69, 91-94, 102-105, 107, and 109 are rejected under 35 U.S.C. 102(e) as being anticipated by Riley (US – 6,865,395 B2).

Regarding claims 38, and 91, Riley discloses a system, and a method comprising:

- a database containing predicted receive signal strength information for multiple antenna patterns of a wireless network access node (col. 6, lines 13-24);
- measurement logic for measuring receive signal strengths of a signal received using said multiple antenna patterns, said signal being

transmitted by a device disposed within one or more of said multiple antenna patterns (col. 6, lines 13-24);

- comparison logic for comparing said measured receive signal strengths to said predicted receive signal strength information and identifying a closest match (col. 6, lines 25-30).

Regarding claim 39, Riley discloses the system of claim 38. Riley further discloses wherein said database associates predicted receive signal strength information in sets of multiple antenna patterns having a distance associated therewith (col. 5, lines 1-24).

Regarding claim 40, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said database associates predicted receive signal strength information in sets having a position associated therewith (col. 5, lines 1-24).

Regarding claim 41, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said predicted receive signal strength information is predicted using a generic propagation model (col. 5, lines 1-10).

Regarding claim 42, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said predicted receive signal strength information includes predicted receive signal strength information of a plurality of wireless network access nodes (col. 6, lines 31-47).

Regarding claim 43, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said database further contains predicted receive signal strength information for multiple antenna patterns of a second wireless network access

node (col. 6, lines 13-24), said measurement logic is further for measuring receive signal strengths of a signal received from said device using said multiple antenna patterns of said second wireless network access node (col. 6, lines 13-24), and said comparison logic is further for comparing said measured receive signal strengths of said second wireless network access, node to said predicted receive signal strength information of said second wireless network access node and identifying a closest match (col. 6, lines 25-30).

Regarding claim 44, Riley discloses the system of claim 43 as described above. Riley also discloses further comprising: location estimation logic for determining an estimated location of said device from an intersection point of arcs projected identified distances from said wireless network access node and said second wireless network access node (fig. 2, and its descriptions).

Regarding claim 45, Riley discloses the system of claim 43 as described above. Riley also discloses further comprising: location estimation logic for determining an estimated location of said device from a midpoint of positions associated with said closest matches from said wireless network access node and said second wireless network access node (col. 6, lines 48-65).

Regarding claim 46, Riley discloses the system of claim 43 as described above. Riley also disclose further comprising: location estimation logic for determining an estimated location of said device from position information stored in association with said closest match (col. 6, lines 13-21).

Regarding claim 47; Riley discloses the system of claim 38 as described above. Riley also discloses wherein said measurement logic and said comparison logic are disposed at a centralized system in communication with a plurality of wireless network access nodes (col. 9, lines 1-19).

Regarding claim 48, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said measurement logic and said comparison logic are disposed in a distributed configuration (col. 9, lines 1-19).

Regarding claim 49, Riley discloses the system of claim 48 as described above. Riley also discloses wherein said measurement logic is disposed within said wireless network access node (fig. 1, and its descriptions).

Regarding claim 62, Riley discloses the system of claim 38 as described above. Riley also discloses said comparison logic is disposed at a centralized system in communication with a plurality of wireless network access nodes (fig.1, element 120).

Regarding claim 63, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said comparison logic is disposed in a distributed configuration (fig. 1, element 120 and its descriptions).

Regarding claim 68, Riley discloses the system of claim 38 as described above. Riley also discloses asset tracking logic for providing at least one of asset tracking and asset inventorying automatically as a function of said identified closest match (col. 6, lines 13-24).

Regarding claim 69, Riley discloses the system of claim 38 as described above. Riley also discloses wherein said closest match is utilized in identifying a location of said device in a service area of a wireless network (col. 6, lines 31-47).

Regarding claims 92, and 94. Riley discloses the method of claim 91 as described. Riley also discloses identifying a distance, and position associated with said closest match (col. 6, lines 25-47).

Regarding claim 93, Riley discloses the method of claim 92 as describe above. Riley also discloses estimating a position of said device as a function of said distance (col. 6, lines 25-47).

Regarding claims 102-104, Riley discloses the method of claim 91 as described above. Riley also discloses providing network access, data content, and management of network resources as a function of said closest match (fig. 1, elements 120 & 130 and its descriptions).

Regarding claim 105, Riley discloses a system for providing location positioning of a device in a wireless network, said system comprising:

- a channel model independent determination algorithm utilizing receive signal strength differences between multiple antenna patterns of a wireless network node to determine information with respect to a position of said device (col. 4, lines 8-42);
- a channel model based determination algorithm utilizing receive signal strengths of said multiple antenna patterns to determine information with respect to a position of said device (col. 4, line 43- col. 5, line 11).

Regarding claim 107, Riley discloses the system of claim 105 as described above. Riley also discloses wherein said channel model based determination algorithm further utilizes signal strength predictions provided by modeling an environment of said wireless network (col. 6, line 48 – col. 7, lines 12).

Regarding claim 109, Riley discloses a system for providing location positioning of a device in a wireless network, said system comprising: a channel model based determination algorithm utilizing receive signal strengths of said multiple antenna patterns and signal strength predictions provided by modeling an environment of said wireless network to determine information with respect to a position of said device (col. 5, lines 1-65).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 27-30, 33-37, 88-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benes.

Regarding claims 27-28, Benes discloses the system of claim 1 as described above, except for security logic for preventing, or providing levels of access to a wireless network by said device as a function of said identified closest match. It is

however well known in the art to provide security logic such as authentication, authorization code in order to prevent or authorize access to a network or service.

Regarding claims 29-30, 88-90, Benes discloses the system, and method of claims 1, and 75 as described above, except for the content delivery logic for providing content via a wireless network to said device as a function of said identified closest match, and management logic for providing management of at least one of wireless communications and wireless communication system resources as a function of said identified closest match. It is however obvious to one skill in the art because there must be a way to manage the communications and delivery the content from the network to the device since that is how the system communicate and transmit information between each other.

Regarding claims 33-37, Benes discloses the system of claim 32 as described above, except for disclosing wherein said wireless network comprises a wireless local area network, a metropolitan area network, a cellular network, a satellite network, a point-to-multipoint broadband network. However, it is well known in the art since these are various networks that are being used.

8. Claims 64-67, and 70-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley.

Regarding claims 64-65, Riley discloses the system of claim 38, except for security logic for preventing, or providing levels of access to a wireless network by said device as a function of said identified closest match. It is however well known in the art

to provide security logic such as authentication, authorization code in order to prevent or authorize access to a network or service.

Regarding claims 66-67, Riley discloses the system of claim 38 as described above, except for the content delivery logic for providing content via a wireless network to said device as a function of said identified closest match, and management logic for providing management of at least one of wireless communications and wireless communication system resources as a function of said identified closest match. It is however obvious to one skill in the art because there must be a way to manage the communications and delivery the content from the network to the device since that is how the system communicate and transmit information between each other.

Regarding claims 70-74, Riley discloses the system of claim 69 as described above, except for disclosing wherein said wireless network comprises a wireless local area network, a metropolitan area network, a cellular network, a satellite network, a point-to-multipoint broadband network. However, it is well known in the art since these are various networks that are being used.

9. Claims 9-11, 15-26, 31, and 79-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benes in view of Riley (US – 6,865,395 B2).

Regarding claim 9, Benes discloses the system of claim 1 as described above, except for wherein said database further contains antenna gain differences between multiple antenna patterns of a second wireless network access node, said calculation logic is further for determining receive signal strength differences of a signal received

from said device using said multiple antenna patterns of said second wireless network access node, and said comparison logic is further for comparing said receive signal strength differences of said second wireless network access node to said antenna gain differences and identifying a closest match.

In a similar endeavor, Riley discloses an area based position determination for terminals in a wireless network. Riley also discloses wherein said database further contains antenna gain differences between multiple antenna patterns of a second wireless network access node (col. 6, lines 13-24), said calculation logic is further for determining receive signal strength differences of a signal received from said device using said multiple antenna patterns of said second wireless network access node (col. 6, lines 13-24), and said comparison logic is further for comparing said receive signal strength differences of said second wireless network access node to said antenna gain differences and identifying a closest match (col. 6, lines 25-30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the values of the second wireless network access node in order to compute and locate the location of the device

Regarding claim 10, Benes and Riley disclose the system of claim 9 as described above. Riley further discloses comprising: location estimation logic for determining an estimated location of said device from an intersection point of vectors projected from said wireless network access node and said second wireless network access node (fig. 2, and its descriptions).

Regarding claim 11, Benes and Riley disclose the system of claim 9 as described above. Riley also discloses location estimation logic for determining an estimated location of said device from position information stored in association with said closest match of said antenna gain differences (abstract).

Regarding claim 15, Benes discloses the system of claim 1 as described above, but fails to teach these claimed limitations.

In a similar endeavor, Riley discloses an area based position determination for terminals in a wireless network. Riley also discloses comprising:

- a database containing predicted receive signal strength information for said multiple antenna patterns of said wireless network access node (col. 6, lines 13-24);
- measurement logic for measuring receive signal strengths of a signal received from said device using said multiple antenna patterns (col. 6, lines 13-24);
- comparison logic for comparing said measured receive signal strengths to said predicted receive signal strength information and identifying a closest match (col. 6, lines 25-30).

It would have been obvious to one of ordinary skill in the art at the time the invention to incorporate Riley's invention to locate a position of the device more accurately.

Regarding claim 16, both Benes and Riley disclose the system of claim 15. Riley also discloses wherein said database containing predicted receive signal strength

information associates predicted receive signal strength information in sets having a distance associated therewith (col. 4, lines 54-65).

Regarding claim 17, Benes and Riley disclose the system of claim 15. Riley further discloses wherein said database containing predicted receive signal strength information associates predicted receive signal strength information in sets having a position associated therewith (col. 4, lines 54-65).

Regarding claim 18, Benes and Riley disclose the system of claim 15 as described above. Riley also discloses wherein said predicted receive signal strength information is predicted using a generic propagation model (col. 5, lines 1-10).

Regarding claim 19, Benes and Riley disclose the system of claim 15 as described above. Riley also discloses wherein said predicted receive signal strength information includes predicted receive signal strength information of a plurality of wireless network access nodes (col. 6, lines 31-47).

Regarding claims 20, and 79, Benes and Riley disclose the system, and method of claims 15, and 75 as described above. Riley further discloses wherein said database containing predicted receive signal strength information further contains predicted receive signal strength information for multiple antenna patterns of a second wireless network access node (col. 6, lines 13-24), said measurement logic is further for measuring receive signal strengths of a signal received from said device using said multiple antenna patterns of said second wireless network access node (col. 6, lines 13-24), and said comparison logic is further for comparing said measured receive signal strengths of said second wireless network access node to said predicted receive signal

strength information of said second wireless network access node and identifying a closest match (col. 6, lines 25-30).

Regarding claim 21, Benes and Riley both disclose the system of claim 20 as described above. Riley further discloses comprising: location estimation logic for determining an estimated location of said device from an intersection point of arcs projected identified distances from said wireless network access node and said second wireless network access node (fig. 2, and its descriptions).

Regarding claim 22, Benes and Riley both disclose the system of claim 20 as described above. Riley also discloses location estimation logic for determining an estimated location of said device from a midpoint of positions associated with said closest matches from said wireless network access node and said second wireless network access node (col. 6, lines 48-65).

Regarding claim 23, Benes and Riley disclose the system of claim 20 as described above. Riley further discloses comprising: location estimation logic for determining an estimated location of said device from position information stored in association with said closest match of said predicted receive signal strength information (col. 6, lines 13-21).

Regarding claim 24, Benes and Riley both disclose the system of claim 15 as described above. Benes also discloses wherein said measurement logic and said comparison logic for comparing said measured receive signal strengths are disposed at a centralized system in communication with a plurality of wireless network access nodes (paragraph 0028; fig. 1, and its descriptions).

Regarding claim 25, Benes and Riley both disclose the system of claim 15 as described above. Benes also discloses wherein said measurement logic and said comparison logic for comparing said measured receive signal strengths are disposed in a distributed configuration (paragraphs 0027-0028).

Regarding claim 26, Benes and Riley disclose the system of claim 25 as described above. Benes also discloses wherein said measurement logic is disposed within said wireless network access node (paragraph 0028).

Regarding claim 31, Benes discloses the system of claim 1 as described above, except for asset tracking logic for providing at least one of asset tracking and asset inventorying automatically as a function of said identified closest match.

In a similar endeavor, Riley discloses an area based position determination for terminals in a wireless network. Riley also discloses asset tracking logic for providing at least one of asset tracking and asset inventorying automatically as a function of said identified closest match (col. 6, lines 13-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the asset tracking in order to use the data in helping to determine the position of the device

Regarding claim 80, Benes and Riley disclose the method of claim 79 as described above. Benes also discloses identifying a direction associated with said closest match of said antenna gain differences; and identifying a distance associated with said closest match of said receive signal strengths (paragraphs 0028-0030).

Regarding claim 81, Benes and Riley disclose the method of claim 80 as described above. Benes also discloses estimating a position of said device as a function of said direction and said distance (paragraphs 0028-0030).

Regarding claim 82, Benes and Riley disclose the method of claim 79 as described above. Benes also discloses identifying a direction associated with said closest match of said antenna gain differences (paragraph 0026); and identifying a position associated with said closest match of said receive signal strengths (paragraph 0027).

Regarding claim 83, Benes and Riley disclose the method of claim 79 as described above. Benes also discloses estimating a position of said device as a function of said closest match of said antenna gain differences (paragraph 0026); and separately estimating a position of said device as a function of said closest match of said receive signal strengths (paragraph 0027).

Regarding claim 84, Benes and Riley disclose the method of claim 83 as described above. Riley also discloses wherein a one of said position estimates is used to confirm the other of said position estimates (co. 6, lines 31-47).

Regarding claim 85, Benes and Riley disclose the method of claim 79 as described above. Benes further describes identifying a position associated with said closest match of said antenna gain differences (paragraph 0026); identifying a position associated with said closest match of said receive signal strengths (paragraph 0027); and estimating a position of said device as a function of said position associated with

said antenna gain differences and said position associated with said receive signal strengths (paragraph 0026-0028).

10. Claims 50-61, 95-101, and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riley in view of Benes.

Regarding claim 50, Riley discloses the system of claim 38 as described above. Riley, however, fails to disclose comprising: a database containing antenna gain differences between said multiple antenna patterns of said wireless network access node; calculation logic for determining receive signal strength differences of a signal received from said device using said multiple antenna patterns; and comparison logic for comparing said receive signal strength differences to said antenna gain differences and identifying a closest match.

In a similar endeavor, Benes discloses a method and mobile station for autonomously determining an angle of arrival estimation. Benes further discloses a database containing antenna gain differences between said multiple antenna patterns of said wireless network access node (paragraphs 0021-0023); calculation logic for determining receive signal strength differences of a signal received from said device using said multiple antenna patterns (paragraph 0026); and comparison logic for comparing said receive signal strength differences to said antenna gain differences and identifying a closest match (paragraph 0027).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate with Benes's invention to better locate the position of the device.

Regarding claim 51, both Riley and Benes disclose the system of claim 50 as described above. Benes also discloses wherein said database containing antenna gain differences associates ones of said antenna gain differences in antenna gain difference sets (paragraph 0021).

Regarding claim 52, Riley and Benes disclose the system of claim 51 as described above. Benes also discloses wherein said antenna gain difference sets include angle information (paragraph 0022).

Regarding claim 53, Riley and Benes disclose the system of claim 51 as described above. Benes also discloses wherein said antenna gain difference sets include position information (paragraph 0020).

Regarding claim 54, Riley and Benes disclose the system of claim 51 as described above. Benes also discloses wherein antenna gain difference sets include antenna gain differences of a plurality of wireless network access nodes (paragraph 0018).

Regarding claim 55, Riley and Benes disclose the system of claim 54 as described above. Benes also discloses wherein said antenna gain difference sets include position information (paragraph 0020).

Regarding claim 56, Riley and Benes both disclose the system of claim 50 as described above. Riley also discloses wherein said database containing antenna gain

differences further contains antenna gain differences between multiple antenna patterns of a second wireless network access node (col. 6, lines 13-24), said calculation logic is further for determining receive signal strength differences of a signal received from said device using said multiple antenna patterns of said second wireless network access node (col. 6, lines 13-24), and said comparison logic for comparing said receive signal strength differences is further for comparing said receive signal strength differences of said second wireless network access node to said antenna gain differences and identifying a closest match (col.6, lines 25-30).

Regarding claim 57, Riley and Benes disclose the system of claim 56 as described above. Riley also discloses location estimation logic for determining an estimated location of said device from an intersection point of vectors projected from said wireless network access node and said second wireless network access node (figs. 7A & 7B, and its descriptions).

Regarding claim 58, Riley and Benes disclose the system of claim 56 as described above. Riley also discloses location estimation logic for determining an estimated location of said device from position information stored in association with said closest match of said antenna gain differences (abstract).

Regarding claim 59, Riley and Benes both disclose the system of claim 50 as described above. Riley also discloses wherein said calculation logic and said comparison logic for comparing said receive signal strength differences are disposed at a centralized system in communication with a plurality of wireless network access nodes (fig. 9, and its descriptions).

Regarding claim 60, Riley and Benes disclose the system of claim 50 as described above. Riley further discloses wherein said calculation logic and said comparison logic for comparing said receive signal strength differences are disposed in a distributed configuration (col. 15, lines 29-56).

Regarding claim 61, Riley and Benes disclose the system of claim 60 as described above. Riley also discloses wherein said calculation logic is disposed within said wireless network access node (col. 15, lines 29-56).

Regarding claim 95, Riley discloses the method of claim 91 as described above, except for calculating antenna gain differences between said multiple antenna patterns of said wireless network access node; determining receive signal strength differences of a signal received from said device using said multiple antenna patterns; and comparing said receive signal strength differences to said antenna gain differences and identifying a closest match.

In a similar endeavor, Benes discloses a method and mobile station for autonomously determining an angle of arrival estimation. Benes also discloses wherein calculating antenna gain differences between said multiple antenna patterns of said wireless network access node (paragraphs 0021-0023); determining receive signal strength differences of a signal received from said device using said multiple antenna patterns; and comparing said receive signal strength differences to said antenna gain differences and identifying a closest match (paragraphs 0026-0027).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the antenna gain differences in order to determine the location of the device.

Regarding claim 96, Riley and Benes both disclose the method of claim 95 as described above. Benes further discloses identifying a direction associated with said closest match of said antenna gain differences (paragraphs 0027-0028); and identifying a distance associated with said closest match of said receive signal strengths (paragraphs 0027-0028).

Regarding claim 97, Riley and Benes both disclose the method of claim 95 as described above. Benes also discloses estimating a position of said device as a function of said direction and said distance (paragraphs 0026-0027).

Regarding claim 98, Riley and Benes both disclose the method of claim 95 as described above. Benes also discloses identifying a direction associated with said closest match of said antenna gain differences (paragraphs 0027-0028); and identifying a position associated with said closest match of said receive signal strengths (paragraphs 0027-0028).

Regarding claim 99, Riley and Benes disclose the method of claim 95 as described above. Benes also discloses estimating a position of said device as a function of said closest match of said antenna gain differences (paragraph 0026); and separately estimating a position of said device as a function of said closest match of said receive signal strengths (paragraph 0027).

Regarding claim 100, Riley and Benes disclose the method of claim 99 as described above. Riley also discloses wherein a one of said position estimates is used to confirm the other of said position estimates (col. 6, lines 31-47).

Regarding claim 101, Riley and Benes disclose the method of claim 95 as described above. Benes also discloses identifying a position associated with said closest match of said antenna gain differences (paragraph 0026); identifying a position associated with said closest match of said receive signal strengths (paragraph 0027); and estimating a position of said device as a function of said position from said antenna gain differences and said position from said receive signal strengths (paragraph 0028).

Regarding claim 106, Riley discloses the system of claim 105 as described above, except for wherein said channel model independent determination algorithm further utilizes antenna gain differences between said multiple antenna patterns.

In a similar endeavor, Benes discloses a method and mobile station for autonomously determining an angle of arrival estimation. Benes further discloses wherein said channel model independent determination algorithm further utilizes antenna gain differences between said multiple antenna patterns (fig. 10, box 1020).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the antenna gain differences to determine the position of the device.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dufour, Daniel (US 5,613,205 A)

Reudink et al (US 6,236,849 B1)

Messier et al (US 6,246,861 B1)

Chow, Peter El Kwan (US 6,771,966 B1)

Bahl et al (US 6,839,560 B1)

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne Cai whose telephone number is (571) 272-7798. The examiner can normally be reached on Monday-Friday; 9:00-6:00; alternating Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Wayne Cai
Examiner
Art Unit 2681

ERIKA A. GARY
PRIMARY EXAMINER